

METHOD AND APPARATUS FOR VIRTUALIZING NETWORK RESOURCES

ABSTRACT OF THE DISCLOSURE

[0052] A method and apparatus for managing communications for collaborative applications. Middleware uses, network, application, and middleware resource information together with user information to facilitate communications between the application resources and the users via a hierarchical control structure that implements a communication overlay tree. That overlay tree is implemented in view of network constraints, and on the users and on their communication constraints. The middleware provides user index identifiers that inform the application that specific users have communication interests in specific parts of the application space. To send data to users that are interested in a specific part of the application space the application sends that data with a list of user index identifiers. The middleware then associates the user index identifiers with individual users and routes sent data to the individual users along the overlay tree.